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CVI. *Abstract of a Letter from Mr. William Arderon, F.R.S. to Mr. Henry Baker, F. R. S. on the giving Magnetism and Polarity to Brass. Communicated by Mr. Baker.*

Dear Sir,

Read Nov. 16,
1758.

FOR some time past I have been making experiments on the magnetism of brass, and amongst many pieces that I have tried, find several that readily attract the needle; but whether they have had this property originally, or have received it by hammering, filing, clipping, or any other such-like cause, I cannot yet determine.

I have a very handsome compass-box made of pure brass, as far as I can judge: the needle being taken out, and placed upon a pin fixed properly in a board, and clear of all other magnetics, the box will attract this needle at half an inch distance; and, if suffered to touch, will draw it full 90 degrees from the north or south points; and I think those parts of the box marked north and south attract the strongest. The cover of the box also attracts the needle nearly as much as the box itself.

As to your supposition, that iron may be mixed with the brass, I do not know; but I have been informed it cannot be, as brass fluxes with a much less degree of heat than iron, and iron naturally swims on fluid brass. Besides, many of the specimens of brass I have tried were new as they came from the mill, where they were wrought into plates, and I presume
were

were not mixed *; yet these I have given the magnetic virtue to, when they had it not; and some pieces of brass, which naturally attract the needle, seem to the eye as fine a bright yellow as any other, and are as malleable as any I ever met with.

Pieces of brass without any magnetic power, by properly hammering and giving them the double touch, after Mr. Mitchel's method, I have made attract and repel the needle, as a magnet does, having two regular poles: and I now send you one such piece of brass, which I have thus made magnetical. You will also receive a couple of needles, which I made myself after the late Zachary Williams's method, and a little stand whereon to place them, the better to shew how this magnetic bar attracts and repels the needle when properly applied; for it must be noted, that in making these experiments it is necessary to employ a very good needle, about $3\frac{1}{2}$ inches long, well and tenderly set, and not covered with glass.

You will observe, when you try this bar, that the same poles repel each other, and the contrary poles attract; which proves this piece of brass to be indued with true magnetic virtue and polarity. However it must be noted, that though the same poles repel each other, yet, like natural magnets, in contact, or nearly so, they attract each other; therefore when you would shew the repelling power of this brass bar, you must not bring it nearer the needle than $\frac{2}{10}$ of an inch.

Magnetic brass does not attract iron, not even the least particle, so far as I can find: whether this is

* This refers to Mr. Baker's having supposed, that old iron and old brass may be mixt sometimes, and melted down together.

owing to the weakness of magnetism in the brass, or to some other cause, I don't pretend to know.

I have tried to infuse magnetic virtue into several pieces of copper, lead and pewter ; but all my endeavours have not been able to make them attract the needle at all. Indeed, when I have held a piece of pewter, that I have tried to make magnetical, to the needle, the needle would tremble, but not approach the pewter.

I send you another piece of brass, whose either end attracts either of the poles ; this I have infused the magnetic virtue into, and can at any time, so as to attract and repel the needle ; but, like steel that is set a low blue, it loseth that polarity in a few hours ; which may arise for its being too short for its weight, or from its different temper of hardness or softness.

A third piece I also send you, which with all my endeavours I cannot make attract the needle in the least ; and yet I can perceive no difference between the appearance of this piece and that of those which do.

Would some ingenious man pursue these experiments, perhaps we might have needles made of brass to act as strongly as steel ones do, which would have the advantage of being less liable to rust at sea than steel ones are.

But my whole design was to shew, that brass is by no means a proper metal to make compass-boxes of, or to be employed in any instrument where magnetism is concerned. For as it is demonstrable, beyond all contradiction, that some brass is found endued with a power of attracting the magnetic needle ; that other pieces are capable of receiving it either by
accident

accident or design, (let it be from its being mixed with iron, or any other cause whatever) brads must be a very improper metal for compafs-boxes, as it may occasion many sad and fatal accidents.

Norwich, Octob. 20th, 1758.

It is well known, that brads has been sometimes found to affect and disturb the magnetic needle; but, to give magnetism and polarity to brads, has not, that I have yet heard, been before attempted. I therefore have taken the liberty to lay the above account before this Royal Society, and have also brought the pieces of brads mentioned therein, which have been thus made magnetical.

London,
Nov. 15. 1759.

H. Baker.

CVII. *An Account of the Sea Polypus, by*
Mr. Henry Baker, F. R. S.

To the Right Honourable the EARL of MACCLES-
FIELD, President of the Royal Society.

My Lord,

Read Nov. 23, 1758. **I** now return the marine animal your Lordship did me the honour to recommend to my examination; which I find to be a species of one kind of the Sea Polypi, mentioned by naturalists; but I think not very accurately described.

The kinds of Sea Polypi are understood to be,
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